Maine Department of Transportation

Highway Program

Design Guidance

Title: Guardrail Upgrade Considerations Issue Date: October 1, 2015

Discipline: General Engineering

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Background:

Engineering Instruction C8: Guardrail and Guardrail Terminal Policy provides direction on compliant installation of new guardrail and guardrail terminals, as well as when upgrades to existing systems are required. On Restoration/Resurfacing projects, there is no requirement to make any upgrades as long as there is no pattern of crashes. However, the engineering instruction also indicates that consideration should be given to the potential safety and economic benefits to making upgrades even when not required. This Guidance is intended to provide direction on when to consider guardrail and guardrail terminal upgrades.

Guidance:

Existing Guardrail Height

Consider adjusting guardrail height if the following conditions exist or will exist after final pavement surface is placed:

Corridor Priority 1-3: height less than 26 ½"

Corridor Priority 4-6: height less than 24 ½"

Height is measured from the final pavement surface at face of rail to the top of the guardrail beam. Raising the height to 30" is desirable, but raising the height to 27 ¾ inches is acceptable if limitations exist. If the rail must be removed to adjust the height, consideration should be given to replacing steel offset blocks with wood or composite blocks.

Existing/Proposed Guardrail Terminal Height

Consider adjusting or replacing guardrail terminals based on the same height allowances as indicated above. When guardrail terminals are adjusted or newly installed, they should be adjusted to or installed at 27 ¾ inches. When raising guardrail height to 30", terminal height should transition over 25 feet. New terminals, except on low volume roads and at entrances, should be selected appropriately from the Department's Qualified Products List.

Other Considerations

In addition to height, consider the following when assessing the need to upgrade guardrail:

1. Crash history that may indicate a problem that needs attention
2. Damage that affects structural integrity or serviceability
3. Inadequate soil backing, especially when raising the height of the guardrail
4. Erosion that may affect vehicle interaction with the guardrail
5. Leaning Posts increase snagging potential and reduce effective guardrail height
6. Compliance with standards (post spacing, offset block material, crash tested terminals, etc.)